

application. This appeal is taken from the final rejection of the pending claims 1, 5, 12 and 16 under 35 U.S.C. § 103(a) over admitted prior art (figure 5 of the specification) in view of U.S. Patent 4,560,912 to Jonsson. Claims 2-4, 7, 9, 13-15, 18 and 19 are rejected under 35 U.S.C. 112, first paragraph. Claims 1-5, 7, 9, 12-16, 18 and 19 are rejected under 35 U.S.C. 112, second paragraph. Claims 13-15 are rejected under 35 U.S.C. § 112, but have been deemed allowable if amended and rewritten in independent form.

IV. Status of Amendments

All pending amendments have been entered.

V. Summary of the Invention

The invention relates to a motor operated fast-food service window with upwardly focused proximity detectors.

This invention pertains to access windows and similar equipment, more particularly to access windows for drive-through and walk-up fast-food service installations. These access windows are typically provided in a building, such as a fast-food service establishment, a convenience drive-up food store, a service station attendant's booth, a free-standing kiosk, or the like. (Specification p. 2, l. 3-7.) In a typical commercial environment a drive-up access window must easily permit the clerk to transact business with a customer and yet provide the necessary isolation between the outside environment and the inside environment to satisfy health and safety requirements. (Specification p. 2, l. 13-16.)

In one embodiment of the present invention, a plurality of upwardly focused infrared emitter/receivers mounted on the internal side of a fast-food service window in a manner emitting an upwardly focused infrared beam. (Specification p. 4, l. 1-4, FIG. 1.) The upwardly oriented sensors are coupled to an electric motor that opens the window as an employee prepares to deliver merchandise or other items to a customer. (Specification p. 4, l. 13-15.) An object is sensed if the amount of light at a near receiver or detector is greater than the amount of light at a far receiver or detector. (FIG. 6.) In one embodiment, the proximity sensors are mounted to reliably detect a clerk wishing to service a customer as the clerk reaches across the

horizontal service plane proximate to the access window (just prior to servicing a customer). The proximity sensors substantially reject any false signals from passing employees who do not intend to service a customer, thereby virtually eliminating the inadvertent opening of the access window. (Specification p. 8, l. 6-19.) Upwardly focused sensing elements provide a significant reduction in unintentional opening actions because only product or goods being passed above or over the sensors activate the window. (Affidavit of Steven Halliburton, ¶ 10.)

VI. Issues

Is the claim language “wherein said angle is about 10°” sufficiently supported by the specification and claims as originally filed in view of 35 U.S.C. 112, first paragraph?

Is the claim language “said sensor being focused upward at an angle that deviates from the vertical direction by not more than 10°” sufficiently supported by the specification and claims as originally filed in view of 35 U.S.C. 112, first paragraph?

Do references in claims to things with which the apparatus of an invention interacts which are not elements of a claimed apparatus and but which are expressed according to ordinary English usage make the claims indefinite under 35 USC 112, second paragraph?

May claims be rejected under 35 U.S.C. §103 based on an allegedly obvious modification of the cited references, which modification is contrary to the teachings of the art?

Even if a *prima facie* case under 35 U.S.C. §103 had been made, does proof of actual existence of proximity-sensor service windows without the allegedly patentable features for a long time and despite a recognized need for improvement establish that an invention is not obvious?

Are dependant claims 12 and 16 erroneously rejected under 35 U.S.C. 103 because the cited art does not disclose an apparatus with proximity sensors directed such that the torso of a person approaching the window is not detected before an extended arm of the person?

VI. Grouping of Claims

Claims 2-4, 7, 9, 13-15, 18 and 19 are rejected under 35 U.S.C. 112, first paragraph. The claims of the group do not stand or fall together. Claim 18 is representative with respect of claims 2-4, 7, 9, 13-15, and 18. Claim 19 is believed to be separately patentable.

Claims 1-5, 7, 9, 12-16, 18 and 19 are rejected under 35 U.S.C. 112, second paragraph. The claims of the group do not stand or fall together. Claim 1 is representative of claims 1, 3-5, 7, 9, 12-16, 18 and 19. Claim 2 is believed to be separately patentable.

Claims 1, 5, 12 and 16 are rejected under 35 U.S.C. 103(a). The claims of the group do not stand or fall together. Claim 1 is representative of claims 1 and 5. Claim 12 is representative of claims 12 and 16, which are believed to be separately patentable.

The suggested representative claims are, therefore, independent claim 1, dependent claim 18 (from claim 1), dependent claim 19 (from claim 18), dependent claim 12 (from claim 1) and independent claim 2.

VII. Argument

This application relates to access windows for drive-through and walk-up fast-food service establishments. Typically an attendant may deal with a customer through an automatically opening and closing window. If the window does not open or if it opens or closes at the wrong time, the window may interfere with delivering product to the customer or receiving payment from the customer. Such a window may be opened and closed in excess of 900 times a day at a single establishment. It is well known that there are large numbers of fast-food service establishments. Given the number of fast-food service establishments and the extent of use of automatic windows, it is clear that improvements in delivery of service are important. Automatic windows closing on food packages or on the hands or arms of attendants or customers is not desirable.

The prior art has provided automatic windows triggered by manual or body-contact switches or by proximity sensors or by light-beam sensors directed in a

generally horizontal plane at about waist height. (Specification, p. 2, l. 17-20 and p. 3, l. 6-11.) Although generally effective, horizontally directed proximity sensors generate false openings and closings by being too sensitive (opening when an attendant is near, but not using the window (affidavit of Steven Halliburton, ¶ 8)); not sensitive enough (closing when the attendant's torso, but not arms and food, shifts slightly out of range (Specification p. 10, l. 15-20)); or inconsistent (responding differently to light and dark clothing (affidavit of Steven Halliburton, ¶9)). Automatic door opening systems, although not specifically opening service windows, have used proximity sensors directed either downwardly or horizontally to detect a person approaching a door. (E.g., Boiucaner '152, Utke '747, or Gionet et al. '437.) An automatic service window with horizontally directed proximity sensors has been marketed. (E.g., Reltec Brochure.)

Applicants have discovered that if the proximity sensors on an automatic fast-food service window are oriented generally vertically, thereby sensing primarily the presence of products or the arms and hands of an attendant, the number of false openings and closings are reduced. Each of the independent claims 2 and 3 and dependent claim 18 recites similar language, specifically, "an upwardly focused proximity sensor . . . focused upwardly at an angle that deviates from a vertical axis", ". . . wherein said angle is not more than about 10°" (claim 1 plus claim 18) or "a plurality of upwardly focused proximity sensors . . . said sensors being focused upward at an angle that deviates from a vertical axis by not more than about 10°" (claim 2) or "an upwardly focused infrared proximity sensor . . . said sensor being focused upward at an angle that deviates from a vertical axis by not more than about 10°" (claim 3). The claims of this group are rejected as containing subject matter not described in the specification. Applicants respectfully disagree. Claim 19 is also rejected as containing subject matter not described in the specification. Applicants respectfully disagree and offer additional grounds in support of this claim.

Claims 1, 5, 12 and 16 are rejected under 35 U.S.C. § 103 as obvious over admitted prior art (Fig. 5 of the specification) in view of Jonsson '912. With respect to exemplary claim 1, this combination of references does not show sensors focused

upward at an angle slightly askew from a vertical. Claim 1 is, therefore, *prima facie* allowable. The examiner has argued that this new feature is an obvious modification to be made routinely by a search for an optimum range. Applicants have responded with reasoning and affidavit evidence to counter this assertion. The examiner has not provided any evidence beyond the examiner's stated opinion.

In compliance with long established Patent Office rules, Applicants requested that the Examiner provide an affidavit under 37 C.F.R. §1.104. The Examiner has declined to do so.

With respect to the second set of claims (12 and 16), exemplary claim 12 requires that the proximity sensor be directed such that the torso of a person approaching the fast-food service window is not detected by the proximity sensor before an extended arm of that person is detected. The examiner asserts that "... references such as Jonsson teach sensing of an outwardly extended arm before the detection of a torso." (Action of 11/21/2001, page 6, lines 15-17.) The examiner mentions no particular part of the reference. Applicants respectfully disagree, as will be shown below. The examiner has not established a *prima facie* case for rejection of claims 12 and 16.

Although the Examiner has failed to make a *prima facie* case for rejection of claim 1 under 35 U.S.C. §103, Applicants have also provided affidavit evidence in support of the non-obviousness of the claimed invention. Applicants respectfully submit that the Examiner has erred in failing to properly consider this evidence.

WHERE A LIMITATION IS INHERENTLY SUPPORTED BY THE DISCUSSION OF THE ORIGINAL DISCLOSURE THERE IS SUFFICIENT SUPPORT IN THE PARENT APPLICATION TO SATISFY 35 U.S.C. 112.

The first issue that should be resolved by the Board is whether applicants are entitled to claim their invention by the language "said sensors being focused upward at an angle that deviates from the vertical by not more than about 10°". Claim 18 is representative. Claim 1 (from which claim 18 depends) is rejected under 35 U.S.C. 103, but is clearly supported by the specification. Claim 19 (which depends from

claim 18) is also rejected under 35 U.S.C. 112, but no separate argument was provided by the examiner with respect to this claim, and claim 19 will be shown to be clearly supported by the disclosure. Neither claim 18 nor claim 19 are rejected on the basis of art.

Applicants maintain that the specification as originally filed clearly allows persons of ordinary skill in the art to recognize that applicants invented what is claimed. Therefore, the claim language, “an angle that deviates from the vertical by not more than about 10°”, although not found explicitly in the original specification, is permissible. It must be remembered that this is a mechanical case, not a chemical case. Chemical cases may present additional complications not raised by this case. Applicants believe that a fair reading of the specification discloses that they were in possession of the claimed invention.

The specification, as filed, contained the following relevant descriptions of the direction of the sensors:

“The preferred embodiment of the apparatus comprises a plurality of upwardly focused infrared emitters/receivers mounted on the internal side of a fast food service window at an angle slightly off of the horizontal plane in a manner emitting an infrared beam at an angle slightly askew of the vertical axis.” (Specification, page 4, lines 1-4, emphasis added.)

[The window detects] “. . . the proximity of an employee reaching across the horizontal service area as such employee reaches towards a customer on the outside of the window.” (Specification, page 5, lines 2-4.)

“FIGURE 1 is a perspective view of . . . a plurality of upwardly focused proximity sensors . . .”

“The preferred embodiment of the present invention having [sic, “has”] a plurality of upwardly focused proximity sensors 29 . . .” (Specification, page 7, lines 4-5.)

“In the preferred embodiment, the proximity sensors are mounted askew of the horizontal plane (illustrated by line 35) in a manner that the centerline 36 of proximity sensor 29 is askew from the vertical axis (illustrated as line 37) by the angle alpha (sic, “α”). In the preferred embodiment the angle alpha is approximately 10 degrees. An angle alpha of approximately 10 degrees has been found to reliably detect a clerk wishing to service a customer as the clerk reaches across the horizontal service plane proximate to the access window (just prior to servicing the customer). This angle alpha has been found to be such

that the proximity sensors substantially reject any false signals, from passing employees who do not intend to service a customer, thereby virtually eliminating the inadvertent opening of the access window.” (Specification, page 8, lines 8-19, emphasis added.)

“The angle alpha of approximately 10 degrees has also been found to be sufficient to avoid a ceiling panel or other ceiling surface from reflecting light emitted by the LED back to receivers or detectors R1 or in a manner to falsely trigger the window to open.” (Specification, page 8, line 24 to page 9, line 2.)

“An electrically operated fast-food service window with a plurality of upwardly focused infrared emitter/receivers mounted on the internal side of a fast-food service window in a manner such to emit an infrared beam at an angle slightly askew of the vertical axis.” (Abstract, lines 3-6, emphasis added.)

The original claims also support a range of angles for the above mentioned angle alpha (“ α ” in the drawings).

“ . . . an upwardly focused proximity sensor . . . ” (Claim 1, line 5.)

“ . . . a plurality of upwardly focused proximity sensors . . . ”

(Claim 2, line 5.)

“ . . . an upwardly focused infrared proximity sensor . . . ” (Claim 3, line 5.)

“ . . . the sensor centerline is slightly askew from the vertical axis.” Claim 6, lines 1-2.)

“ . . . at least one centerline is slightly askew from the vertical axis.” (Claim 8, lines 1-2.)

“ . . . at least one of the infrared sensors emits a beam at an angle just slightly askew of the vertical plane.” (Claim 10, lines 1-3.)

The original specification described and claimed an apparatus with upwardly pointed proximity sensors angled just slightly askew of the vertical plane. There is no question that the description comprises straight up (straight up is certainly “upward”) as well as angles away from the vertical down to some angle less than 90°. 90° is horizontal and has been shown by applicants to be in the prior art. (See Realtec Brochure.) In rejecting the claims, the examiner has relied on Figure 5 of the disclosure, which does not show a service window with a proximity sensor (although the Realtec Brochure does), and on Jönsson as illustrative of an upwardly pointed

proximity sensor. Jönsson shows a proximity sensor tilted at an angle of 30° from the horizontal, that is, 60° from vertical. Assuming for the sake of this argument that the angle shown by Jonsson met the limitation of “upwardly pointed” (but not “just slightly askew of the vertical plane”) in the original claims, it is clear that one of ordinary skill in the art would recognize that the original claims (a part of the disclosure) supported a range of angles from vertical down to some limit, perhaps as far as 60°.

The original disclosure also gave as an example the angle 10°, shown as an angle from a vertical axis. The specific language of the claims “an angle that deviates from the vertical by not more than about 10°” is not used in the original specification. The issue, then, is whether applicants are entitled to claim their invention on the basis that is implicitly disclosed in the original specification, but is not explicitly stated. Applicants respectfully maintain that the claim language is permissible, does not go beyond a fair reading of the original disclosure, and incorporates no new matter into the specification, though the form of the claims has changed.

To support amended claims, applicants are, of course, entitled to rely on the specification, claims and drawings as originally filed. MPEP § 2163 gives guidance in this area:

“ . . . An objective standard for determining compliance with the written description requirement is, “does the description clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed.” *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989). Under *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991), to satisfy the written description requirement, an applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention, and that the invention, in that context, is whatever is now claimed. The test for sufficiency of support in a parent application is whether the disclosure of the application relied upon “reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter.” *Ralston Purina Co. v. Far-Mar-Co., Inc.*, 772 F.2d 1570, 1575, 227 USPQ 177, 179 (Fed. Cir. 1985) (quoting *In re Kaslow*, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983)). . . .” [MPEP § 2163.02, emphasis added.]

If applicant amends the claims and points out where and/or how the originally filed disclosure supports the amendment(s), and the examiner finds that the disclosure does not reasonably convey that the inventor had possession of the subject matter of the amendment at the time of the filing of the application, the examiner has the initial burden of presenting evidence or reasoning to explain why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims. . . . [MPEP §2163.05(b), emphasis added.]

. . . With respect to changing numerical range limitations, the analysis must take into account which ranges one skilled in the art would consider inherently supported by the discussion in the original disclosure. In the decision in *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976), the ranges described in the original specification included a range of "25%- 60%" and specific examples of "36%" and "50%." A corresponding new claim limitation to "at least 35%" did not meet the description requirement because the phrase "at least" had no upper limit and caused the claim to read literally on embodiments outside the "25% to 60%" range, however a limitation to "between 35% and 60%" did meet the description requirement. . . . [MPEP 2163.05(c), emphasis added. In *re Wertheim* was a chemical case wherein the range was extended beyond an explicit upper limit.]

With respect to claims 1-3, applicants originally claimed an apparatus with "upwardly pointing proximity sensor" or sensors at an angle "slightly askew from vertical". A sensor pointing directly up is clearly "upwardly pointing", that is, zero degrees is inherent in any fair reading of the language "upwardly pointing". The vertical axis is thus clearly within and supported by the claims as originally filed. (Compare, *contra* the examiner's argument, Final Action of 11/21/2001, page 5, lines 8-10.) An angle slightly askew from the vertical axis was disclosed and was claimed. The specific example of 10° was also given in the specification. The examiner states that "[t]he recitation 'not more than about 10 degrees' includes angles not supported by the disclosure such as an angle of 1 degree." (Final Action of 3/26/2003, page 5, lines 4-5.) Applicant respectfully asserts that if 10° is an angle "slightly askew from the vertical axis", then angles less than 10°, such as 1°, are also angles slightly askew from the vertical axis, and are thus disclosed in the original specification.

The examiner has not come forward with evidence or reasoning to explain why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims.

CLAIM 19 IS SUFFICIENTLY DESCRIBED IN THE SPECIFICATION

Claim 19 is rejected under 35 U.S.C. 112, first paragraph a containing subject matter not described in the specification. Claim 19 is: "[t]he fast food service window wherein said angle is about 10°." [Emphasis added.] As pointed out above, the language of the specification is "In the preferred embodiment the angle alpha is approximately 10 degrees " [Specification, page 8, line 9. Emphasis added.] Applicants see no logical distinction between "about" and "approximately", nor has the examiner offered any explanation directed to this language alone. Claim 19 is allowable and is supported by the specification.

REFERENCES IN CLAIMS TO THINGS WITH WHICH THE APPARATUS OF AN INVENTION INTERACTS DO NOT MAKE THE CLAIMS INDEFINITE

The examiner has rejected claims 1-5, 7, 9, 12-16, 18 and 19 under 35 U.S.C. 112, second paragraph, as being indefinite. Claim 1 is representative of claims 1, 3-5, 7, 9, 12-16, 18 and 19. (Applicants acknowledge with appreciation that the examiner has indicated that claims 13-15 would be allowable, except for this alleged defect in their parent claim, claim 1.) The examiner has stated that he is unsure if an "arm" (claim 1, line 10) is an "object" (claim 1, line 7), and, therefore, that the claims are unclear. Applicants respectfully disagree.

Both "object" and "arm", as used in claim 1, refer to things in the real world with which the apparatus of the claimed invention interacts in a described way, but are not items to which applicants assert a proprietary interest by reason of the claims. A "person" who extends his arm over a proximity sensor does not become part of the claimed fast-food service window. Similarly, the "arm" of the person does not become part of the apparatus, merely because a proximity sensor is directed to detect the arm, if the arm is extended over the sensor. Claiming a living human being or a part of one would be improper.

Proximity sensors detect by reflecting radiation off an object, but the object is not therefore a part of the proximity sensor. The element of the claim at issue here is “an upwardly focused proximity sensor”. Applicants respectfully maintain that in ordinary English usage, an arm is an object, though there are many other kinds of objects in the world. Nevertheless, where neither the object nor the arm is an element of the claim, that is, an “element” of the apparatus, strict antecedent basis is not required for either understanding or for clarity. Thus, a proximity sensor may be described both as sensing radiation “reflected from an object being sensed” and as being “directed to detect an extended arm of a person” without loss of clarity. and without a need to explicitly state that an arm is a type of object. It is the proximity sensor that is claimed and not an object or an arm detected by that sensor. The claims meet the standard of 35 U.S.C. 112, and particularly point out and distinctly claim the subject matter of the invention.

CLAIM 2 IS CLEAR

Claim 2 is rejected on the same basis as claims 1, 3-5, 7, 9, 12-16, 18 and 19 under 35 U.S.C. 112 (an alleged confusion between an object and an arm, addressed above). The examiner does not separately address claim 2. Claim 2, however, does not contain any reference to an arm. “Arm” and “object” cannot be used unclearly, since arm is not used at all. The rejection of claim 2 on this ground is improper.

CLAIMS MAY NOT BE REJECTED UNDER 35 U.S.C. §103 BASED ON AN ALLEGEDLY OBVIOUS MODIFICATION OF THE CITED REFERENCES, WHICH MODIFICATION IS CONTRARY TO THE TEACHINGS OF THE ART

The Examiner has rejected claims 1 and 5 (and 12 and 16, below) under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art of figure 5 in view of Jonsson. Claim 1 is representative.

It is respectfully asserted that the claims do not read on the combination of references. The examiner states that Jonsson’912 discloses a sensor 10 that “. . . is angled at an angle slightly askew from a vertical axis . . .”. Applicants respectfully traverse this characterization of Jonsson ‘912. Jonsson ‘912 at most shows sensors

that are slightly askew from a horizontal axis. Moreover, the sensors are not directed to detect an arm over the sensor. The examiner has failed to make a *prima facie* case for the rejection of these claims. In the final office action of 11/21/2001, the examiner stated that “. . . one of ordinary skill in the art is expected to routinely experiment with parameters so as to ascertain the optimum workable ranges for a particular use.” (Action of 11/21/2001, page 4, lines 7-9.) Applicants respond that the area and direction claimed is outside the region where one of ordinary skill would search for an optimum direction. Applicants support this assertion by the following arguments and by affidavit evidence.

In the course of the prosecution of this application, the examiner's reasoning for the proposition that the claimed configuration would be routinely discovered has become continually less specific. An examination of the earlier, more specific reasons for rejection reveals why the present general appeal to experimentation is insufficient. For example, the examiner argued that one of ordinary skill would focus a sensor "such that the torso of a person approaching the window is not detected by the sensor." [Paper 32, page 5, line 4.] This principle cannot be found in any of the references and can only be found in the teachings of this application. The prior art taught one to detect the body of the person approaching an automatic door or window. Once the body had been detected, there was no motivation in the prior art to continue to search for a configuration where the body is not detected, or to aim for extended arms and not for the body.

As another example, on page 4 of paper 13, the Examiner argued that Boiucaner taught that a door should be operated “. . . when a person is in a desired predetermined position . . .” [Emphasis added.] The Examiner stated that Hagenbook, Jönsson, Utke and Gionet et al. similarly each teach operation of a closure (a door) “. . . when a person is in a predetermined position . . .” [Paper 13, page 7. Emphasis added.] Clearly, the Examiner drew the same conclusion as others in the art, that is, that it is the body or person of the attendant that should be detected. Applicants' invention, however, detects product or the hands and arms of the attendant, rather than the person.

In the parent case to this CPA application, the Examiner explained more fully his position that “common sense” would necessarily produce the claimed invention by optimization. See Final Rejection May 4, 1999, page 6. The Examiner stated:

“When one with ordinary skill in the art is presented with problems created by the limited range of the sensor of the admitted prior art in figure 5 and the teachings of Boiucaner, he or she would replace the sensor of the admitted prior art in figure 5 with the sensor of Boiucaner. Although Boiucaner discloses orienting the sensor in the downward position, Boiucaner teaches placing the sensor in a particular position for a particular use, i.e. sensing when a person is close enough to the door to warrant opening the door. One with ordinary skill in the art, armed with the particular orientation for a particular use teaching of Boiucaner and his or her common sense, would orient the sensor in a way which would yield the best results for fast-food window use. It is the examiner’s position that the best results for the fast-food window application would be an upward orientation since the feet of the workers might be undesirably sensed by the sensor. Thus, by orienting the sensor in the upward position, it would only be able to sense when that person was in position to use the window. . . .” [Emphasis added.]

This argument has not been explicitly re-iterated in this CPA proceeding. Rather, the examiner has been less explicit in explaining why one of ordinary skill would optimize the prior art away from the torso, as taught by that art. Nevertheless, it is not clear how the desire to avoid sensing the feet would necessarily dictate an upward orientation for the sensors. Since a person’s feet are generally directly below his or her center of gravity when standing or walking, it is unclear why sensing the feet would be any different from sensing the torso generally or why the person of ordinary skill in the art would orient the sensors to point up rather than out or down. As far as the prior art is concerned the optimum area of focus for sensors opening doors or windows is towards the torso, not away from it. The examiner has offered no other specific argument to explain why the ordinary individual would direct the sensors away from the torso, as taught by the art.

Applicants will now address the remaining general assertion that experimentation for the sake of optimization would lead the routine craftsman (person of ordinary skill in the art) to the invention. As a preliminary matter, applicants note that the prior art of figure 5 does NOT show a proximity sensor.

Figure 5 shows a light beam type sensor wherein the employee must place a part of his body between a light source or emitter 61 and a receiver or detector 62 and must stay there to keep the window open. When the employee leans forward to deliver product, her waist may shift away from the window, thus keeping the employee's center of gravity over the employee's feet. This natural motion can move the employee's body out of the light path and cause the window to close just as the employee is reaching towards a customer.

Nevertheless, proximity sensors have been used with service windows, as applicants have pointed out heretofore in connection with the Reltec apparatus. This art and additional examples of use of proximity sensors with service windows, presented by affidavit, show outwardly or downwardly directed proximity sensors, not sensors focused upward at an angle slightly askew of a vertical axis °. The issue is not merely whether a person of ordinary skill would combine the Jonsson configuration with a service window. Rather, one must further modify the structure to aim the sensors upward at an angle only slightly askew from the vertical axis. As set forth in the affidavits of James Epps, Tom Kirkaldy, Mark Neubauer, and Jackson Weaver, the person of ordinary skill would not make such a modification. The person of ordinary skill would continue follow the teachings of the art and focus sensors where a person's torso would be expected to be.

The present invention represents a departure from the teachings and use in the art. All of the prior art, including Jonsson, teach one to detect the torso of a person approaching a door or service window. Under the teachings of the prior art, one stops searching when the body is detected. There is no motivation in the art to continue to elevate the focus of the sensors, as taught herein.

As recently pointed out by the Federal Circuit in *All-Site Corp. v. VSI Int'l, Inc.*, 50 U.S.P.Q.2d (BNA) 1161, 1171 (Fed. Cir. 1999), it is improper to attempt to use level of skill in the art to supply a missing teaching:

VSI argues that it would have been obvious to one of ordinary skill in the art to punch a hole in the Seaver security tag and hang it from a cantilevered support... VSI is unable, however, to point to any specific teaching or suggestion for making this combination. VSI instead relies on what it presumes is the level of

knowledge of one of ordinary skill in the art at the time of the invention to supply the missing suggestion to combine. In the first place, the level of skill in the art is a prism or lens through which a judge or jury views the prior art and the claimed invention. This reference point prevents these deciders from using their own insight or, worse yet, hindsight, to gauge obviousness. Rarely, however, will the skill in the art component operate to supply missing knowledge or prior art to reach an obviousness judgment. *See W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 U.S.P.Q. (BNA) 303, 312-313 (Fed. Cir. 1983) ("To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.") Skill in the art does not act as a bridge over gaps in substantive presentation of an obviousness case, but instead supplies the primary guarantee of objectivity in the process. [Citations omitted.]

The Applicants' invention lies substantially in the recognition of the source of a problem. Applicants have recognized that detection of the presence of product or of the arms of an attendant near an automatic window have a greater correlation to the desired state of the window than does the torso or center of mass of the attendant. Simply put, prior art devices have been detecting the wrong things. The prior art triggering mechanisms for automatic windows fall generally into two categories: mechanical switches and sensors. (Specification, p. 2, l. 17-20 and p. 3, l. 6-11.) Mechanical switches, which must free the hands of the attendant to hold product, have generally been operated by contact with the hip or side of the attendant, that is, with the attendant's torso. Sensors directed out, down or across have been configured to detect the presence of the attendant's torso or the main body mass of the attendant. (E.g., specification at p. 10, l. 10-20, affidavit of Steven Halliburton, ¶18, and Reltec Product Brochure, p. 3.) This principle can be seen in each of the references cited by the Examiner, including Jonsson. By way of example, the admitted prior art of Fig. 5 has a light beam that intersects the attendant at waist height. With arms raised to carry food products, the attendant will interrupt the beam with his or her torso. The other references in this case describe automatic doors and also clearly detect the entire body of a person approaching the door. There is no need for detecting product carried by an attendant or a selected part of the body and

no suggestion that limited detection would be desirable. By recognizing that detection of product or only a part of the body is more effective than detection of the whole body, applicants have contributed to the automatic window art. Applicant's apparatus with upwardly pointed proximity sensors is entitled to be patented.

As pointed out above, applicants had found that angles which deviated only slightly from vertical were able "... to reliably detect a clerk ..." and "... to be such that the proximity sensors substantially reject any false signals, from passing employees who do not intend to service a customer, thereby virtually eliminating the inadvertent opening of the access window. ..." and "... to be sufficient to avoid a ceiling panel or other ceiling surface from reflecting light emitted by the LED back to receivers or detectors R1 or in a manner to falsely trigger the window to open." (Specification, page 8.)

The U.S. Supreme Court's decision in *Eibel Process Co. v. Minnesota & Ontario Paper Co.* (261 U.S. 45 (1923)) emphasizes the relevance of the inventor's discovery of the source of the problem. The problem in *Eibel Process* was the limited rate of production in a paper-making machine. The unrecognized source of the problem was unequal speeds of paper pulp and supporting wire at a particular point in the process. Having recognized the source of the problem, the inventor altered the slant of a pre-existing paper-making machine by twelve inches or more and allowed gravity to increase the speed of the paper pulp. The Court upheld the claim to the improved machine. The Court said:

"... The invention was not the mere use of a high or substantial pitch to remedy a known source of trouble. It was the discovery of the source of trouble. It was the discovery of the source not before known and the application of the remedy for which Eibel was entitled to be awarded his patent. ..." *Eibel Process Co. v. Minnesota & Ontario Paper Co.* (261 US 45 (1923))

As will be demonstrated below, it has been known for a long time that automatic windows open or close at inappropriate times. Nevertheless, where sensors have been used, the apparatus have sensed the whole body of the attendant. The art relied on by the Examiner is representative of this situation. It had

not been recognized that it is primarily product held by the attendant and a more limited portion of the body that should be sensed. The Examiner's arguments rejecting Applicant's claims fail to recognize this fundamental distinction in principle.

Prior automatic windows and apparatus disclosed in the patent literature sensed the torso of the person approaching a door or window. The best evidence of what one of ordinary skill in the art would do is what they did do, as seen in the affidavits of James Epps, Tom Kirkaldy, Mark Neubauer, and Jackson Weaver and in the Reltec Product. (See Reltec Equipment Inc Product Brochure, page 3, copyright 1989 (Information Disclosure Statement and affidavit of Steven Haliburton, ¶ 7).) Proximity sensors directed to detect the body have not only been known but have actually been used in automatically opening fast-food service windows since at least 1989. Nevertheless, no one proposed upwardly oriented proximity sensors before applicants. It was not what the prior art taught. Under the prior art, one would not search for an optimum direction for sensors away from the torso of a person approaching the door or window.

**EVIDENCE ESTABLISHING THE EXISTENCE OF A LONG FELT NEED IS
SUFFICIENT TO SHOW THAT THE CLAIMED INVENTION WAS NOT OBVIOUS**

In addition to evidence of what the teachings of the art meant to persons in the field, Applicants have submitted documentary and affidavit evidence to show the existence of a long felt need for an automatic window or door which reduces the number of false openings and closings. Applicants' claimed invention fills the identified need in a new and different way. The evidence shows that others have proposed different solutions to this problem. Some are quite complex, such as Jonsson. Despite this search for solutions, the invention claimed herein was not made by routine optimization, as suggested by the examiner. This is objective evidence of non-obviousness. It is respectfully submitted that this evidence rebuts a case of obviousness under 35 U.S.C. §103, even if a *prima facie* case had been made.

Applicants submit that it has long been recognized that automatic doors may

open or close at inappropriate times. In particular, where automatic doors are controlled by proximity sensors, the sensors are usually sensitive to the reflectivity, e.g., the color or shape, of the person or object approaching the door. This problem is expressed and recognized, for instance, in US Patent 4, 029,176 to Mills. The inventor stated that one of the objects of his 1975 invention was: ". . . to provide an improved apparatus for detecting substantial objects of any nature without regard to their electrical or physical properties, texture, temperature, color, shape or motion." (Col. 3, line 16-20.) The inventor's proposed solution is an ultrasonic proximity sensor directed horizontally or downwardly.

The Jonsson '914 patent clearly establishes that false opening and closing of doors, particularly doors controlled by proximity sensors, was a known problem at least as early as May 1979, the priority date of Jonsson '914. Jonsson '914 is derived from a Swedish application filed in May 1979. This application resulted in a series of US patents including US 4,467,251, US 4,888,532, and US 4,590,410. The earliest of this series, US 4,467,251, was published by the Patent Office on August 21, 1984. The disclosure of the Jonsson '914 patent has, therefore, been available in English in the United States since at least 1984 and no one, before applicants, made the modifications suggested by the examiner to meet the limitations of the claims.

Jonsson '914 (and Jonsson ' 251) explain the problem of false openings and closings in some detail at column 5, beginning at line 6:

. . . In this respect, the sensing apparatus of FIG. 1 is preferred to the conventional reflection type object sensing apparatus by reason of the fact that it is less susceptible to variations in object detecting range with variation in radiation reflectivity of the object. Prior art reflective object sensing apparatus makes use of a focused or collimated beam of light, which is directed outward in the direction from which an object is anticipated to approach. The radiation is reflected off the object and received by a sensing apparatus which also has a relatively narrow focused beam which is oriented in the identical direction. The range at which the object will be sensed by this type of apparatus will depend largely on the reflectivity of the object. An object such as a retro-reflecting device, which sends back a relatively focused beam of radiation toward the emitter will cause a very large response in the receiving device and

may be detected at a very large range. An object of irregular shape which has relatively low reflectivity, such as a dull black overcoat, will not be detected until it is very close to the radiation detector. . . .

The solution to this problem proposed by Jonsson is not upwardly pointed proximity sensors. Jonsson teaches a diffuse lighting system wherein light from one or more emitters is received by one or more receivers. The emitters and receivers are spaced apart from each other to allow this rather wide light path. As explained in column 6, lines 4-28, Jonsson believed that this arrangement would solve the problem of inappropriate opening and closing caused by different reflectivity (e.g., dark or light clothing) because diffuse light from multiple emitters could be received by multiple receivers.

In Column 6, line 55-68, Jonsson explains that in the illustrated embodiment, the sensors are mounted about 15 inches above the floor, ". . . to detect objects near the bottom of the door." (Col. 6, line 67-68.) The sensors are oriented "slightly upward from horizontal direction." (Col. 6, line 62-63.) A person of ordinary skill in the art, reading Jonsson, would be taught that proximity sensors, even those mounted near the bottom of a door, could be tilted upward no more than slightly upward from horizontal direction, so that they would continue to detect objects near the bottom of the door. In fact, it has been suggested that sensors oriented slightly above the horizontal direction would nevertheless fail to detect small objects near the floor. Commenting on Jonsson '912, Tsutsumi et al., (US Patent 5,963,000) stated that ". . . the system of U.S. Patent No. 4,560,912 sometimes cannot detect a small object, e.g., an infant, on or near the floor." (Col. 1, lines 53-55.) Tsutsumi et al. then provides a plurality of downwardly pointed proximity sensors. Clearly, one of ordinary skill in the art would understand Jonsson as teaching the importance of detecting objects near the floor. One might even question the effectiveness of orienting sensors slightly above the horizontal direction. One would certainly not direct the sensors upward at an angle slightly askew of a vertical axis, where the sensors could not detect objects near the floor and where they would not be initially detecting the torso of a person approaching the door.

US Patent 4,851,746 to Milke is also concerned with the problem of false openings and closings in proximity sensor controlled automatic doors. In discussing the Jonsson series of patents ('410, '912, and '251), Milke explained that the solution proposed by Jonsson was a plurality of emitters that ". . . generate diverging beams of diffuse (rather than focused) radiation . . . " (Col. 2, line 29-30.) Milke then again provides a plurality of downwardly or horizontally directed proximity sensors. Thus Milke provides further evidence that one of ordinary skill in the art, aware of both the problem of accurate detection and of the Jonsson reference, would not make the claimed invention with proximity sensors focused upward at an angle slightly askew of a vertical axis.

The same can be said of US Patent 4,577,437 to Gionet et al. (of record in the case). Gionet et al. were aware of Jonsson '251. Jonsson '912 is a division of Jonsson '251 issued after the November 26, 1984 filing date of Gionet et al. Gionet et al. is also concerned with the problem of false openings and closings in proximity sensor controlled automatic doors. Once again, despite knowledge of the problem and of the Jonsson reference, Gionet et al. directed their proximity sensors down or horizontally. They explained:

By appropriate tuning of the respective beams emanating from the microwave motion detectors above the door and on opposite sides of the door, they can effectively perform their intended functions without being activated by the door frames, floor, wall or other structures in connection with which the door and doorway are disposed. (Col. 2, line 9-16.)

This identical problem of over or under sensing caused by the differences in employee's clothing colors was observed by James Epps when he tried to design a proximity sensor activated service window. As set forth in the accompanying declaration, In 1990, James Epps, Robert Kramer, Jack Weaver and Mark Neubauer at M.C.E. Systems Corporation (now, Quikserv Corporation) tried to develop a fast food service window with proximity sensors. Relying on the example of doors using proximity sensors, they used a sensor that was directed generally horizontally, to be triggered by the torso of an employee. They found that horizontally directed sensors were not satisfactory. The area around a fast food service window is a "noisy"

environment. That is, there are many false signals in the area. Unlike a door, the employee stays in the general area of the window, taking orders, getting food items and performing other tasks. Proximity sensors aimed to sense the torso of the employee opened the widow at undesirable times.

Moreover, they found that the range of the horizontally directed sensors can not be set sufficiently accurately for this environment. A light-emitting proximity sensor is sensitive not only to the distance of an approaching person, but also to the color of a reflecting surface. A person wearing light colored clothing is detected sooner and more frequently than a person wearing dark clothing. Sensors directed to detect the torso of an employee therefore respond differently to different stimulations. If the sensitivity of the sensor is diminished, to avoid over sensing, employees in dark clothing may be undersensed or not sensed at all. If the sensitivity of the sensor is increased, employees in light clothing may trigger false openings even when not wanting at the window to open. This is the same problem identified by Jonsson.

Quikserv tried to place widows with horizontally directed sensors with Burger King, Jack-in-the-Box and others, but there were so many complaints that they had to withdraw the windows from their offerings.

James Epps is also familiar with other proximity sensor-operated service windows sold in the United States, such proximity sensor-operated service windows from Realtec Equipment Inc. These windows have been offered for sale since at least 1989. Another attempt by the industry to use proximity sensors in service windows were windows offered by Horton Automatics from at least 1989. These windows featured downwardly directed sensors mounted above the service window. These sensors still detect the torso of the employee when the employee approaches the window. Each of these attempts by Quikserv, Realtec and Horton Automatics triggered widow openings by detecting the torso of the employee. They did not direct sensors into a region where the torso of the employee is not sensed before the window is opened. In the windows of Applicant's' invention, the window opens when the employee wants it to open by sensing an object (such as the employee's arm)

directly above the sensors.

Prior to Applicant's invention, a person of ordinary skill in the art would have directed proximity sensors to detect the torso of an employee in order to open an automatic door or service window, whether taught by the patent literature or by actual devices made and sold in the United States, just as James Epps and others in the field of service windows did. The person of ordinary skill would not have directed proximity sensors upward at an angle that deviates from a vertical direction by no more than 10° because sensors so directed would not detect the torso of the employee until the service window had already opened. Moreover, in a service window, the possibility that product spills or an employee's body in contact with the sensor would disrupt the function of the sensor would dissuade the person of ordinary skill from directing proximity sensors upward at an angle slightly askew of a vertical axis, as claimed herein.

The examiner has rejected this evidence on the grounds that the mentioned patents "do not set forth that the art recognized the problem of a person's torso being detected and undesirably causing the actuation of an automatic door/window." (Office Action 11/21/2001, page 7, lines 4-6.) Of course not. That is because this statement by the examiner is a statement of applicant's solution to the problem rather than the clearly recognized problem of false openings and closings. The examiner's argument is a circular one. He seeks to define the problem so narrowly that only applicants' disclosure is relevant. The statement of page 7 of the Action of 11/21/2001 is directly contrary to the examiner's argument that the person of ordinary skill in the art would experiment until the limitations of the claims were achieved. (Office Action 11/21/2001, page 4, lines 5-12.) If the art did not recognize the problem of a person's torso being detected (as the examiner states), then the art does not provide motivation to search in an area where the torso is not likely to be detected.

The examiner also rejected the evidence of Tom Kirkaldy, Mark Neubauer and Jackson Weaver on the grounds that the examiner simply disagrees with the affiants. Applicants respectfully request that the Board independently weigh the evidence.

The Examiner also improperly rejected the affidavit of Steven Halliburton for failing to provide evidence of what the prior art teaches or considering the prior art of record. On the contrary, Mr. Halliburton demonstrates what those in the art did when combining an automatic service window (figure 5 of the specification) and an outwardly or downwardly pointing proximity sensor (Boiucaner, Gionet et al., or Jönsson). The combination suggested by the Examiner of a service window and a proximity sensor was actually offered for sale from at least 1989, but it did not include an upwardly pointing proximity sensor. The Reltec Catalog (copyright 1989) shows this device and is explicitly referred to in paragraph 7 of Mr. Halliburton's affidavit. The actual problems experienced when using the device and associated with outwardly pointing proximity sensors are then set forth in paragraphs 8 and 9. In paragraph 10, Mr. Halliburton states that the claimed upwardly focused sensor significantly reduces unintentional openings ". . . because only products or goods being passed above or over the sensors activate (open) the window." As noted above, this is a different principle of operation from sensing the presence of the body of the attendant. Mr. Halliburton's experience extends from about November, 1990, that is, about contemporaneously with the Reltec device that embodies the combination suggested by the Examiner.

The Examiner further, and incorrectly, asserted that the evidence offered is insufficient because affidavits of customers should have been provided. The affidavit of Cheri Roell, Building Materials Specialist for Wendy's International, is the affidavit of a customer. Ms. Roell has experience in the industry since August 1992. (Affidavit of Cheri Roell, ¶ 2.) A fast-food service window that automatically opens without generating too many false opening and false closing operations has long been desired. (Affidavit of Cheri Roell, ¶ 7.) Note that windows with horizontal proximity sensors have been available throughout Ms. Roell's experience. (See affidavit of Steven Halliburton and the photograph on page 3 of the Reltec Product Brochure showing an installation of this type in a Wendy's restaurant.) Ms. Roell is herself familiar with windows having side, straight out and downward sensors, but these windows have generated too many false opening and closing operations. (Affidavit of

Cheri Roell, ¶ 8.) Ms. Roell states that a device having the claimed upwardly pointing proximity sensors reduces the false openings and closings and therefore fills the need for such a device. (Affidavit of Cheri Roell, ¶ 9.)

The affidavit of Ray J. Epps shows that most customers of fast-food service windows are corporations providing fast-food, e.g., Wendy's, Burger King, Arby's, KFC, Jack in the Box, Shell Oil, Chevron, Pizza Hut, Church's Fried Chicken, and Popeye's. (Affidavit of Ray J. Epps, ¶ 11.) This conforms to ordinary experience. The Examiner's suggestion that the affidavit of Ms. Roell should be ignored because she represents a corporate customer is neither realistic nor justifiable.

Ray J. Epps has had personal experience in this field for 13 years. (Affidavit of Ray J. Epps, ¶ 6.) He has personal experience working with customers and knows that personal service windows with side, straight out or downward sensors have generated too many false openings and closings. This testimony corroborates the testimony of a designer (Steven Halliburton) and a customer (Cheri Roell) that a demand has existed for better personal service windows.

A "long felt need" is an important indicator of non-obviousness because it represents a motivation to invent. The drive to invent can be produced either by observation of a problem or customer demand. *In re Mahurkur Patent Litigation*, 831 F. Supp. 1354, 1377-78, 28 U.S.P.Q. 2d (BNA) 1801, 1809 (N.D. Ill, 1993): "If people are clamoring for a solution, and the best minds do not find it for years, that is practical evidence . . . of the state of knowledge." *See also, Henkels & McCoy Inc. v. Elkins* 455 F.2d 936, 937, 172 U.S.P.Q. (BNA) 333 (3d Cir., 1972): "[The inventor's] own testimony showed that . . . increased public protest . . . created strong and urgent commercial demand . . .) In addition to personal experience, therefore, Ray Epps also testifies as one having knowledge of service window supply. In this context, the statements of customers to Mr. Epps concerning their product requirements and satisfaction of those requirements are acts and are not hearsay. The expressed demand for better functioning windows and dissatisfaction with existing technology, including the type of technology suggested by the Examiner, is an act, which produces in the service window supplier the drive to invent, whether or

not the statements made by the customers are true. Thus the “long felt need” of the customer is to have a service window without excessive false openings and closings. The “long felt need” of the supplier is to satisfy the expressed demands of the customer. Even under the Federal Rules of Evidence a statement is only “hearsay” if it is offered to prove the truth of the matter asserted in the statement, not if it is offered to show that the statement was made. (FRE 801(c).) In the context of the Ray Epps affidavit, statements by customers of their requirements motivate invention simply by being said by customers.

Even if paragraphs 9 and 10 of the Ray Epps Affidavit contain hearsay, they would be admissible even in a court proceeding as statements of the customer’s mental or emotional condition under FRE 803(c).

Even if paragraphs 9 and 10 of the Ray Epps Affidavit were both hearsay and inadmissible in Federal Court proceedings, the rest of the affidavit must still be considered. (*See, e.g., In re Rinehart*, 531 F.2d 1048, 189 U.S.P.Q. (BNA) 143 (CCPA, 1976) and *In re Piasecki*, 745 F.2d 1468, 233 U.S.P.Q. (BNA) 785 (Fed. Cir., 1984)) In particular, paragraphs 6, 7, 8 and 11 are based on the affiant’s experience.

The testimony of James C. Epps is based on personal experience extending over a period of 14 years, and further corroborates the testimony of the other affiants. His experience has been that there is a need for automatic service windows that do not generate an excessive number of false openings and closings during use. Windows with sensors focused down or out have not met that need. As shown above, a window with outwardly focused proximity sensors meets all the criteria of the combination suggested by the examiner and was actually available in the marketplace. Mr. Epps states that automatic windows with upwardly focused proximity sensors do not generate excessive false openings and closings. Therefore such devices, which are the claimed invention, fill the identified need. Based on his experience, Mr. Epps states that service attendants have greater freedom of movement as a consequence of using devices having the claimed feature.

Applicants’ invention, as represented by exemplary claim 1, differs from the prior art in that an automatically opening service window has upwardly pointing

proximity sensors focused upward at an angle slightly askew of a vertical axis. Affiants have testified that automatically opening service windows have existed but have not solved the problem of inappropriate opening and closing of the windows. (Affidavit of James C. Epps, ¶ 8; affidavit of Cheri Roell, ¶8; affidavit of Ray J. Epps, ¶7; affidavit of Steven Halliburton, ¶¶ 7-9.) The experience of the affiants extends from 14 years (James Epps) to 7.5 years (Cheri Roell). Since at least 1989 a product having outwardly directed proximity sensors (the combination hypothesized by the examiner) has been available, but has not met the need for reduced false response in automatic windows. Affiants identified the claimed feature of upwardly pointed proximity sensors as the critical feature and that the use of upwardly pointing proximity sensors reduces inappropriate responses, thereby meeting the identified and long-standing need. (Affidavit of James C. Epps ¶9-10; affidavit of Cheri Roell, ¶9; affidavit of Ray J. Epps, ¶¶ 9-10; and affidavit of Steven Halliburton, ¶¶9-11.)

Rejection of a claimed invention under 35 U.S.C. §103 is almost always a speculative exercise. In this case the Examiner has speculated that the person of ordinary skill in the art when combining an automatic service window (figure 5 of the disclosure) with a proximity sensor would ignore the teachings of Jönsson or of Bioucancer, Gionet et al., or other art that proximity sensors should be directed to detect the body of a person approaching the door or window and would instead direct the sensors upwardly and only slightly askew of a vertical axis, as taught by Applicants. Applicants have demonstrated that the combination of an automatic service window with a proximity sensor was actually known and marketed, that it had outwardly directed proximity sensors, and that it was less effective than the claimed upwardly directed proximity sensors in connection with characteristics that customers wanted improved. Nevertheless the supposedly “obvious” modification was not made by others.

It is respectfully submitted that even if the Examiner had made a *prima facie* case for obviousness by identifying all the claimed elements of the invention (which is not the case as discussed above), or if the Examiner had supported the deficiencies in the *prima facie* case by an appropriate affidavit or detailed argument

(as requested by Applicants), the proffered evidence nevertheless demonstrates that the claimed invention was not in fact obvious to a person of ordinary skill in the art. The claims should, therefore, be allowed.

Applicants respectfully suggest that the art has clearly recognized the problem that automatic doors/windows were undesirably actuated, and proposed many different solutions. The art did not recognize applicants' solution: that the torso should not be the principle feature detected, and therefore that the proximity sensors should be focused where the torso is not.

DEPENDANT CLAIMS 12 AND 16 ARE FURTHER PATENTABLE BECAUSE THE CITED ART DOES NOT DISCLOSE AN APPARATUS WITH PROXIMITY SENSORS DIRECTED SUCH THAT THE TORSO OF A PERSON APPROACHING THE WINDOW IS NOT DETECTED BEFORE AN EXTENDED ARM OF THE PERSON.

The Examiner has rejected claims 12 and 16 (together with claims 1 and 5, above) under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art of figure 5 in view of Jonsson. Claim 12 is representative.

In addition to the grounds for allowance advanced above in connection with claim 1, claims 12 and 16 restrict the direction of the proximity sensors such that the torso of a person approaching the window is not detected before an extended arm is detected. Claim 12 is representative. Jonsson directs the sensors into an area where both the arm and the torso may be detected. See Jonsson '912, Fig. 4 and 5. Claim 12 makes the positive assertion that the torso is not detected before the extended arm. In Jonsson, as in other art, detection would, of course, be dependant on the amount of light reflected, which would be dependant on background, size of the object (the torso is bigger than an arm), color of the object or of clothing, the intensity of the light sources and other factors. The examiner states that "... concerning claim 12, references such as Jonsson teach the sensing of an outwardly extended arm before the detection of the torso." (Action of 11/12/2001, page 6, lines 15-17). The examiner did not identify any particular part of the Jonsson reference in

support of this statement, and applicants have been unable to discover any such teaching in Jonsson. Jonsson employs light emitting diodes. The radiation propagates in straight lines at the speed of light until reflected back to the light sensitive elements 16. The radiation reaches the arms and body of a person substantially instantaneously and simultaneously. There is nothing described in Jonsson that could discriminate between the arm (extended or not) and the torso. In fact, one of the principle advantages of the Jonsson apparatus is its relative insensitivity to the configuration of objects within its range. (See, Jonsson Col. 5, line 57-Col. 6, line 33.) The examiner has failed to make a *prima facie* case for the rejection of this class of claims.

VII. Conclusion

The proposed claim language “at an angle that deviates from a vertical angle by not more than about 10°” is permissible in view of the original disclosure. Claims 2-4, 9, 13-15, and 18 should be allowed.

The proposed claim language “wherein said angle is about 10°” is supported by the specification. Claim 19 should be allowed.

A *prima facie* case of obviousness against pending claims 1, 5, 12 and 16 is not supported by the cited prior art. Modification of the prior art as suggested by the Examiner is not supported by the cited prior art, or by a requested affidavit or other evidence. It has also been shown that, given the teachings of the prior art, a person of ordinary skill would not direct sensors into the region defined by the claims, as this would be contrary to the teachings of the art.

If a *prima facie* case under 35 U.S.C. 103 had been made, however, it has been rebutted by evidence of the actual practices in the art and by evidence of a long-felt need satisfied by the claimed invention. Claims 1, 5, 12 and 16 should be allowed.

All the art cited would detect the torso of a person simultaneously with the detection of an extended arm. The examiner has not made a *prima facie* case for rejection of claims 12 and 16. Claims 12 and 16 should be allowed.

Claims 1-5, 7, 9, 12-16, 18 and 19 are not rendered indefinite by reference to an "object" or an "arm" that are not elements of the claimed apparatus, but only things with which the apparatus may interact. These claims should also be allowed.

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Appendix of Claims

1. (Four times amended) A fast-food service window comprising:
 - a window assembly with at least one movable window member;
 - a window operator assembly mechanically coupled to the movable window member;
 - an upwardly focused proximity sensor comprising an emitter emitting radiation and a receiver receiving radiation from the emitter, said radiation being reflected from an object being sensed, said sensor being focused upward at an angle slightly askew of a vertical axis and functionally coupled to the window operator assembly and directed to detect an extended arm of a person when said arm is extended over said proximity sensor;
 - wherein the movable window member opens whenever said extended arm of said person is sensed by said proximity sensor.
2. (Four times amended) A fast-food service window comprising:
 - a window assembly with at least one movable window member;
 - a window operator assembly mechanically coupled to the movable window member;
 - a plurality of upwardly focused proximity sensors, each of said sensors comprising an emitter emitting radiation and a receiver receiving radiation from the emitter, said received radiation being reflected from an object being sensed, said sensors being focused upward at an angle that deviates from a vertical axis by not more than about 10° and functionally coupled to the window assembly and directed to open the movable window member in response to said proximity sensors.
3. (Four times amended) A fast-food service window comprising:
 - a window assembly with at least one movable window member;
 - a window operator assembly mechanically coupled to the movable window member;
 - a upwardly focused infrared proximity sensor comprising an emitter emitting radiation and a receiver receiving radiation from the emitter, said received radiation being reflected from an object being sensed, said sensor being focused

upward at an angle that deviates from a vertical axis by not more than about 10° and electrically coupled to the window operator assembly and directed to detect an extended arm of a person when said arm is extended over said proximity sensor;

wherein the movable window member opens whenever said extended arm of said person is sensed by said infrared proximity sensor.

4. The fast food service window set forth in claim 3 wherein said movable window member is opened when an upwardly focused infrared beam is detected by the proximity sensor and is closed when the infrared beam is not detected by the proximity sensor.

5. The fast-food service window set forth in claim 1 wherein the sensor has an integral infrared emitter and receiver.

6. Canceled.

7. The fast-food service window set forth in claim 2 wherein each of the sensors has an integral emitter and receiver.

8. Canceled.

9. The fast-food service window set forth in claim 3 wherein the sensor has an integral emitter and receiver.

10. Canceled.

11. Canceled.

12. [Once Amended] The fast-food service window set forth in claim 1 wherein the proximity sensor is directed such that the torso of a person approaching the fast-food service window is not detected by the proximity sensor before said extended arm is

detected.

13. The fast-food service window set forth in claim 1 wherein the proximity sensor is surrounded by a ring which rises above the sensor.

14. The fast food service window set forth in claim 13 wherein the proximity sensor comprises an LED emitter and a receiver and wherein the ring rises above the sensor a distance sufficient for light emitted by the emitter to reflect off an object in contact with the ring and be received by the receiver.

15. [Once Amended] The fast food service window set forth in claim 1 wherein the proximity sensor has a lens and a projection extending beyond the lens a distance sufficient inhibit objects approaching the lens from disabling the functioning of the proximity sensor before said extended arm is detected.

16. [Twice Amended] The fast food service window set forth in claim 1 wherein said window has a bottom frame member and said proximity sensor is mounted adjacent said bottom frame member and is directed upward at an angle sufficient to permit detection of said extended arm of said person approaching the window before detection of the torso of said person approaching said window.

17. (Canceled)

18. [New] The fast food service window set forth in claim 1 wherein said angle is not more than about 10°.

19. [New] The fast food service window set forth in claim 18 wherein said angle is about 10°.